



UNITED STATES SENATOR ★ NORTH CAROLINA

RICHARD BURR

2000 West First Street ♦ Suite 508 ♦ Winston-Salem, NC 27104 ♦ Telephone (336) 631-5125 ♦ Fax (336) 725-4493

FACSIMILE TRANSMISSION

TO: Laura Vaught / Congressional Liaison
ORGANIZATION/AGENCY: Environmental Protection Agency (202-501-1519)
DATE/TIME: 4/30/2015
SUBJECT: *exempt b*
NUMBER OF PAGES (including cover): 24

SENT BY:☐ **David Helsley****Comments:**

Good afternoon.

Please see the attached information *exempt b* provided to our office regarding the problem he has experienced.

Any information is greatly appreciated.

DAVID HELSLEY
CONSTITUENT ADVOCATE
SENATOR RICHARD BURR (NC)
2000 West First Street, Suite 508
Winston-Salem, NC 27104
Office - 800.685.8916
Fax - 336.725.4493

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RICHARD BURR
NORTH CAROLINA

United States Senate

WASHINGTON, DC 20510-3308
(202) 224-3154 Fax: (202) 228-2981

April 30, 2015

Ms. Laura Vaught
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Room 3426 Arn
Washington, District of Columbia 20460-0002

Dear Ms. Vaught:

My constituent, *exempt 6*, recently contacted my office regarding a matter involving the Environmental Protection Agency.

Please see the enclosed information regarding the situation *exempt 6* has experienced. I would appreciate any information you could provide to me that may help address my constituent's concerns.

I appreciate your prompt attention to this matter, and I look forward to hearing from you soon.

Sincerely,



Richard Burr
United States Senator

RB:dh

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UNITED STATES SENATOR ★ NORTH CAROLINA

RICHARD BURR

2000 West First Street ♦ Suite 508 ♦ Winston-Salem, NC 27104 ♦ Telephone (336) 631-5125 ♦ Fax (336) 725-4493

PRIVACY ACT RELEASE FORM

The provisions of Public Law 93-579 (Privacy Act of 1974) prohibit the disclosure of information of a personal nature from the files of an individual without their expressed consent. Accordingly, I authorize Senator Richard Burr or any authorized member of his staff to access any and all of my records that relate to the problem stated below.

FEDERAL AGENCY OR DEPARTMENT: Please specify the name of the Federal Agency or Department involved in the space provided below:

EPA, DOL, and OPM

PLEASE PRINT ALL INFORMATION CLEARLY:

Circle Preferred Title: Mr. ☒ Ms. ☐ Mrs. ☐ Dr. ☐ Other: ☐

Name:

Date of Birth:

Address:

County:

City:

State:

Zip:

Home Phone:

Work Phone:

Mobile Phone:

Fax:

Email Address:

Social Security Number:

Claim Number:

SIGNATURE:

DATE:

Please list other individuals who have provided release of information on your case:

Name:

Relationship:

Name:

Relationship:

NATURE OF PROBLEM: Please provide a complete and concise statement on the reverse side of this form regarding the nature of the problem and the assistance needed from the office of Senator Richard Burr. Please include all medical conditions that are pertinent to your situation if you are requesting assistance with a disability claim. Please attach copies of any additional pertinent documents.

Please return form to:
Senator Richard Burr
217 Russell Senate Office Building
Washington, DC 20510
Fax: (336) 725-4493

For office use only:

MIL office w/jurisdiction: _____

Location of claim: _____ Dated: _____

DII

STATEMENT:

Dear Senator.

I am a disabled vet that has been trying to get reasonable accommodations for some time. I am dealing with some mental issues that I am trying to conquer to become a more active citizen. My supervisor with the US EPA has been very stonewalled in this process. Her actions, possibly with the support of her superiors has caused my mental issues to worsen. She has asked repeatedly for medical information that has been provided and in an attempt to delay the process, asked follow up questions that have already been provided. She does this to be punitive. Serving this country, as I have, makes this difficult for me to wrap my head around. Please read this history of these documents. My supervisor and I have had issues in the past and were to seek relations intervention, but she apologized and asked me to end that process. I took her at her word which was a mistake. Please help. I feel like I'm losing my sanity and don't want to be a headline.

Sir, Please help me. I'm try to get better despite the obstacle's placed in my way by the EPA.

Doc 1

APPENDIX B

CONFIRMATION OF REQUEST FOR
REASONABLE ACCOMMODATION FORM

1. Today's Date 1/8/2015 2. Date of Request 12/3/2014
3. exempt 4. exempt
Applicant's or Employee's Name Applicant's or Employee's Telephone No.

5. exempt
Employee's Office, Grade and Occupational Series

6. exempt
Employee's Supervisor's Name and Telephone Number

7. exempt
Name and Telephone Number of Agency Official to Which Request was Originally Made

8. TYPE OF ACCOMMODATION REQUESTED: (For example, work place modified for wheel chair usage; assistive technology for vision impairment. If specific equipment or other effective accommodation known, please specify)
Full-time Telework

9. REASON FOR REQUESTING REASONABLE ACCOMMODATION: (Identify functional limitations requiring a change in work place or application process)

See Attached Medical Documentation

10. IS THIS REQUEST LIKELY TO BE REPEATED?: (circle) ☒ YES ☐ NO

11. NAME OF DECISION-MAKER: exempt

12. SIGNATURES

exempt
Employee or Applicant

Agency Official Receiving Request

Return Form to Reasonable Accommodation Coordinator
(Reasonable Accommodation Coordinator will assign number)

Log No.: _____

Exempt knows that I have planned and attended meeting and trainings online. She also knows that we will be going live on a totally web based HR system on

May 4th, 2015. These facts plus other supporting documentation that I have support the fact that these actions are both punitive and retaliatory. I was hired under a VA appointment and this treatment of a Veteran is totally unacceptable.

Exempt

Exempt

Doc 2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

December 17, 2014

FROM:

Deborah A. Caution
Deborah A. Caution
Director, Administrative Management Division
Office of Administration and Policy
Office of Enforcement and Compliance Assurance

SUBJECT:

Request for Medical Flexiplace and the additional documentation needed

TO:

exempt
Administrative Management Division
Office of Administration and Policy
Office of Enforcement and Compliance Assurance

As a follow-up to the conference call that took place on December 10, 2014 between you, me, OAP Director, Mark Badalamente, and OAP Acting Deputy Director, Kenda Layne, I am sending this memorandum to ensure that you and I have a common understanding on the topics we discussed related to your current status and ability to work. Please contact me immediately if you have any questions or concerns regarding the contents on this memorandum.

Your Current Schedule

Your current work schedule is:

Regular Telework on Mondays and Tuesdays;
Working in the office on Wednesdays and Thursdays; and
Compressed on Fridays

Your duty hours are from 7:00 a.m. -- 5:30 p.m., with a 30 minute unpaid lunch break. Please understand that I, or my designee, must approve any modifications to this schedule in advance.

Your Current Functions

Your current position as a GS-0343-13 Management Analyst requires that you are able to perform the following functions:

Type on a keyboard

Answer the telephone
Sit for extended periods of time at a desk
Walk around and hand carry documents for signature
Operate the copier and fax machine
Perform analytical functions
Attend, plan, and conduct meetings
Draft documents and prepare for mailing
Input data

Your Request for Medical Flexiplace

In a December 3, 2014 email, you indicated that you would like to request Medical Flexiplace. As an initial matter, you will need to submit a Medical Flexiplace application (available on the EPA's Intranet site) along with supporting medical documentation from your physician. In consideration of the medical documentation that you recently provided (indicating that you have a sleep disturbance and chronic shoulder pain, and have been rated 100% for a service-connected disability), the medical documentation supporting your Medical Flexiplace application must clarify:

- (1) Which of your job functions you are able to perform, and for approximately how long each day, during the time period for which you are requesting medical flexiplace;
- (2) What your limitations are and whether those limitations are temporary or permanent. If temporary, the documentation should explain how long those limitations are expected to be present.

Please provide this information as soon as possible but no later than January 7, 2015.

Upon receipt of the requested information from your physician, I will be able to fully consider your medical flexiplace request. As discussed during our conference call, while you are collecting the requested information, I am willing to place you on a temporary medical flexiplace arrangement that allows you to work from home full-time, from December 7, 2014 thru January 9, 2015. Please be mindful to request sick and/or annual leave, as appropriate, while you are on this temporary medical flexiplace arrangement. For example, you must request leave for any period of time that you are unable to work on any given day due to medical reasons (medical incapacitation, physical therapy, medical appointment for you or a family member, etc.).

As discussed, I am approving this medical flexiplace arrangement on a temporary basis. I will need to evaluate any further medical flexiplace arrangement beyond January 9, 2015 in light of the supporting documentation requested above. It is important to bear in mind that full-time telework in your current position is not feasible long-term, as your duties and responsibilities require on-site presence on a regular and recurring basis.

Your Reasonable Accommodation Request

In the December 3, 2014 email referenced above, you also indicated that you would like to work from home as a reasonable accommodation, and that you have contacted the reasonable accommodation office. I am supportive of your request for a reasonable accommodation and look forward to working with you to determine your reasonable accommodation needs. In order for me to make an informed decision on your request to work from home as an accommodation (beyond the already approved January 9, 2015 date), I will need the information requested above (i.e., what your limitations are and what functions you are able to perform despite those limitations.).

If you need any additional information or if I can help you, please let me know.

Doc 3



DEPARTMENT OF VETERANS AFFAIRS
W.G. "BILL" HEFNER MEDICAL CENTER
Winston-Salem Community Based Outpatient Clinic
190 Kinel Park Drive
Winston-Salem, North Carolina 27103

In Reply Refer To: 659/

1/2/2015

Re:

exempt b

TO WHOM IT MAY CONCERN:

exempt b is under my care at the VA Outpatient Clinic in Winston-Salem. This letter serves to provide medical documentation for his request to work from home on a full time basis. He does have 100% service connection / rated disabilities for neurosis (which includes anxiety and depression), limited motion of both arms, back pain, hiatal hernia, 2nd degree burns, neuralgia (or nerve pain) and scars. I reviewed his current work schedule and his current job functions and he should be able to perform all of the following functions with accommodations made:

- typing on a keyboard – can perform as long as he does not type more than 20-30 minutes at a time without taking a break
- answering the telephone – no limitations
- sitting for extended periods of time at a desk – can only sit for limited amounts of time without being able to take a break, stand, stretch; maximum of 30 minutes to 1 hour
- walking around and carrying documents for signature – would be affected by depression and the need to limit occupational and social interaction
- operating copier and fax machine – no limitations
- performing analytical functions – no limitations if he is able to work from home, he should perform better at this task
- attending, planning and conducting meetings – limited
- inputting data – no limitations

This patient has had multiple shoulder surgeries and has chronic shoulder pain which account for the limited motion of the arms mentioned above.

He also has a service connection / disability rating for neurosis including depression and had a psychological evaluation by a staff psychologist at the V.A. in 2013 which determined that he would have some occupational and social impairment due to his depression and neurosis symptoms which could decrease work efficiency and ability to perform occupational tasks especially during periods of significant stress. Work accommodations as above would decrease or eliminate this stress and therefore improve his work efficiency and job performance.

Also, his chronic sleep impairment / insomnia causes difficulty adapting to stressful circumstances including work and again, work accommodations as above would serve to improve his work efficiency and job performance.

Thank you,

Christel Keisler, MD 1/2/15

Christel Keisler, M.D.
Staff Physician in Primary Care
V.A. Outpatient Clinic
Winston-Salem NC
336-768-3296 or 336-761-5300



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF CIVIL RIGHTS

February 12, 2015

Christel Keisler, M.D.
Staff Physician in Primary Care
V.A. Outpatient Clinic
W.G. "Bill" Hefner Medical Center
109 Kimel Park Drive
Winston-Salem, NC 27103

RE: Reasonable Accommodation -

exempt

Dear Dr. Keisler:

The United States Environmental Protection Agency is processing a request for reasonable accommodation for an employee. *exempt* I have received and reviewed your letter dated 1/2/15 (enclosed). In an effort to continue processing this employee's request for reasonable accommodation, I would greatly appreciate your clarification of the following:

- Your letters indicate that *exempt* is limited in his ability to sleep. Please describe the extent of this current limitation as compared to most people.
- EPA will consider providing reasonable accommodation(s) that addresses the functional limitations imposed on *exempt* resulting from the disabling condition(s) or any limitations that may flow from negative effects of mitigating measures being used to treat the condition(s) and that will allow him to perform all of his essential job functions. Please describe the current functional limitations imposed on him resulting from the negative effects of mitigating measures used to treat his condition(s).
- You mention in your 1/2/15 letter that walking around and carrying documents for signature—would be affected by depression and the need to limit occupational and social interaction. To what extent should this be limited and why?
- In your letter you also mention that regarding performing analytical functions, there are no limitations if he is able to work from home and he should perform better at this task. Why would he perform better at this function at home?
- In addition, you said that attending, planning and conducting meetings is limited. Can you please be more specific, such as how is this limited and to what manner, extent, duration, etc.?
- Would there be any reason why *exempt* could not work in the office either for part of his job or on occasion if needed?

- Are there any limitations regarding the duration of *exempt* work day?

The Genetic Information and Nondiscrimination Act of 2008 (GINA), prohibits EPA and other entities covered by GINA Title II from requesting or requiring genetic information of employees or their family members. In order to comply with this law, we are asking that you not provide any genetic information when responding to this request for medical information. 'Genetic Information', as defined by GINA, includes an individual's family medical history, the results of an individual's or family member's genetic tests, the fact that an individual or an individual's family member sought or received genetic services, and genetic information of a fetus carried by an individual or an individual's family member or an embryo lawfully held by an individual or family member receiving assistive reproductive services."

Please be assured this information will be maintained in a confidential manner in accordance with the EPA Reasonable Accommodation Procedures and the Privacy Act. I have enclosed a signed EPA "Limited Medical Privacy Release Form." Thank you for your cooperation and please contact me at 202-564-7959 if you have any questions.

Respectfully,

Eileen M. Burrows

Eileen M. Burrows
Acting National Reasonable Accommodation Coordinator
U.S. Environmental Protection Agency
Office of Civil Rights
William Jefferson Clinton-North Bldg
Room 2450 (1201A)
1200 Pennsylvania Avenue, NW
Washington, DC 20460
Phone: (202) 564-7959
Fax: (202) 501-1836

Enclosures: Letter from Dr. Keisler dated 1/2/15
Limited Medical Privacy Release Form

cc (without enclosure):

exempt

d

Deborah A. Caution

Director, Administrative Management Division
 Office of Administration and Policy
 Office of Enforcement and Compliance Assurance
 U.S. Environmental Protection Agency
 1200 Pennsylvania Avenue N. W.
 Rm. 3240C, Mail Stop 2201A
 William Jefferson Clinton Federal Building-South
 Washington, DC 20460
 Phone: (202)564-1663 Fax: (202) 501-0017
 Email: caution.deborah@epa.gov
Respect for Yourself; Respect for Others; Responsibility for all your actions!

*I informed
 my supervisor
 that VA appointments
 are not this fast!*

From: Burrows, Eileen

Sent: Tuesday, March 31, 2015 3:59 PM

To: Caution, Deborah

Cc: *exempt* Tropp, Kristin

Subject: Reasonable Accommodation

Hi Deborah,

This is to inform you that no medical documentation has been received from *exempt* in reference to the letter that was sent to *exempt* medical professional, Dr. Christel Keisler on 2/12/15, regarding *exempt* request for reasonable accommodation. *exempt* was informed of the need for documentation and was provided information of the deadline date to submit the needed information of 3/23/15. As the Designated Agency Decision maker for this employee's request for reasonable accommodation, you have the following options:

- Grant an extension to the 3/23/15 deadline (please be specific of the length of any extension); or
- Deny the request based on the employee's failure to provide the needed information; or
- Offer the employee to be examined by a physician or other appropriate health care professional at EPA's expense (your office); or
- Provide some relief to the employee outside of the reasonable accommodation process.

Your response to this email with your decision is greatly appreciated. Once I receive your response I will be back in touch regarding next steps.

Eileen Burrows

Acting National Reasonable Accommodations Coordinator

U.S. Environmental Protection Agency

Office of Civil Rights (Mail Stop: 1201A)

William Jefferson Clinton—North Bldg.

1200 Pennsylvania Avenue, N.W.

Washington, DC 20460

Phone: 202-564-7959

burrows.eileen@epa.gov

Doc 5

exempt 6

From: Burrows, Eileen
Sent: Thursday, April 02, 2015 10:14 AM
To: exempt 6
Cc: Caution, Deborah; Tropp, Kristin
Subject: RE: Reasonable Accommodation
Attachments: RA FORM AFGE Appendix C-MEDICAL CHECKLIST.doc

exempt 6

Extension granted

The Decision-Maker for your request for reasonable accommodation, Deborah Caution, has agreed to extend the deadline for your medical documentation until 4/20/15. Please provide this email with the questions below (and the Genetic Information Nondiscrimination Act requirements) to your health care professional that you mention in your email below. This medical documentation will be submitted to me to review and determine its sufficiency. The attached Appendix C is a very general checklist of questions that need to be addressed by your health care professional. In addition, the documentation from your health care provider should address the following:

- What is the diagnosed medical condition/s for which this individual is claiming to be disabling?
- What major life activity/activities of this individual is/are affected by the condition/s? Major life activities include, but not limited to breathing, sleeping, walking, talking, seeing, hearing, interacting with other people, or any major body function that may be affected including, but not limited to respiratory system, immune system, neurological system, digestive system, to name a few.
- What are the current functional limitations both on the job and off the job, if any, imposed on this person resulting from the alleged disabling condition/s or any limitations that may flow from negative side effects from any mitigating measures used to treat the condition? How do these limitations affect this person's ability to perform essential job duties? Please describe the extent of any limitations (e.g., manner, duration or condition under which any major life activity can be performed).
- How long have these limitations, if any, been imposed on this person? How long are they expected to continue?
- Please describe any negative and positive side effects this person experiences resulting from the current use of any mitigating measures (e.g., medication, therapy, prosthesis, equipment, etc.).
- Please describe what the limitations on this person and their medical condition/s would be if the currently used mitigating measures were not being utilized?
- EPA will consider providing reasonable accommodation that address the functional limitations imposed on an employee resulting from the disabling condition/s or any limitations that may flow from negative effects of mitigating measures being used to treat the condition/s. Considering any limitations imposed on this individual, if any, resulting from the disabling medical condition/s what reasonable accommodation/s might you suggest that will allow this EPA employee the opportunity to perform the essential duties of their current job? (The employee is asked to provide the health care professional with his/her position description or a list of essential job duties as described by management).

Again, these are general questions to which the Agency needs a response from your health care provider. Because of the individualized nature of medical conditions, there may be more specific questions to which a response is needed. More specific questions, if necessary, are best formulated after reviewing any medical documentation that you submit. At this time, I would ask that you forward to me any medical information that you may currently have in your possession that is related to the medical condition/s for which you are claiming to be disabling and that you would like to be used to process your request for reasonable

accommodation. Any documentation submitted shall be legible (preferably typewritten), signed, dated and on your health care provider's business letter head.

The Genetic Information and Nondiscrimination Act of 2008 (GINA), prohibits EPA and other entities covered by GINA Title II from requesting or requiring genetic information of employees or their family members. In order to comply with this law, we are asking that you not provide any genetic information when responding to this request for medical information. "Genetic Information," as defined by GINA, includes an individual's family medical history, the results of an individual's or family member's genetic tests, the fact that an individual or an individual's family member sought or received genetic services, and genetic information of a fetus carried by an individual or an individual's family member or an embryo lawfully held by an individual or family member receiving assistive reproductive services.

Again, the time period to provide your medical documentation has been extended from 3/23/15 until 4/20/15. To ensure that your request is processed in a timely manner, you are encouraged to provide the necessary medical information to me as soon as possible. Documentation may be sent electronically/email or via mail to:

Eileen M. Burrows
Acting National Reasonable Accommodation Coordinator
US Environmental Protection Agency
William Jefferson Clinton North, Room 2450 (MC 1201A)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Please let me know if you have any questions.

Thank you,

Eileen Burrows
Acting National Reasonable Accommodations Coordinator
Phone: 202-564-7959
Email: burrows.eileen@epa.gov

From: *exemptb*
Sent: Wednesday, April 01, 2015 4:13 PM
To: Burrows, Eileen
Subject: RE: Reasonable Accommodation

I will not! I have been seeing another physician based solely on the fact that the VA treatments are too far between to be effective. Should I forward you her contact information?

Respectfully,

exemptb
Office of Administration and Policy
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
MC: 2201A
exemptb

"Tell me and I forget. Teach me and I remember. Involve me and I learn." --Benjamin Franklin

Sat 18 Apr 2015 07:08:21 PM EDT 3366656168 TRIAD PSYCHIATRIC & COUNSELING CENTER, PPage 2 of 3

Doc 6

TRIAD PSYCHIATRIC AND COUNSELING CENTER, P.A.

Document from another doctor
that I had to get at my
own expense

3511 WEST MARKET ST., STE. 100
GREENSBORO, NC 27403
TELEPHONE (336) 632-3505
FAX (336) 632-3503

April 17, 2014

Eileen Burrows
Acting National Reasonable accommodation Coordinator
U.S. Environmental Protection Agency
Office of Civil Rights (Mail Stop 1201A)
William Jefferson Clinton-North Building
1200 Pennsylvania Avenue, NW
Washington, D.C. 20460
Phone: 202-564-7959
Fax: 202-501-1836

Dear Ms. Burrows,

This letter and medical documentation is in regards to *exempt* (3). He was admitted as a patient in our Outpatient Psychiatric practice on 2/16/15 and was evaluated by Lisa Poulos, APMH-NP, BC. Mrs. Poulos completed his evaluation on that date and referred him for psychotherapy with this writer and Licensed Professional Counselor, Paula Katz, LPCS. I saw *exempt* for an initial evaluation on 3/30/2015 and again for a second session on April 16, 2015. *exempt* reported that he sought therapy in the private sector because the VA was unable to provide timely services to meet his needs.

This letter serves to provide documentation for his ongoing request to work from home as a Management Analyst.

Diagnostic Impression:

Axis I: 293.83 Mood disorder Not Otherwise Specified (moderate) and Rule out 312.34 Intermittent Explosive Disorder (moderate to severe)

Axis II: deferred

Axis III: asthma, chronic pain, 6 shoulder surgeries, limited motion in both arms, neuralgia (nerve pain)

Axis IV: severe: psychosocial stressors include chronic pain and disability, work demands

Axis V: Global Assessment of functioning is a 55

Treatment plan will include weekly therapy sessions to increase emotional coping skills, and interpersonal effectiveness, facilitate healing from trauma (physical and emotional), and develop improved quality of life in emotional, physical, social, intellectual, and spiritual domains. *exempt* treatment will also include medication as prescribed by Lisa Poulos for conditions identified in Axis I above and he will be followed monthly at this time in order to develop an appropriate medication regimen. *exempt* is cooperative, and compliant with his recovery at this time, and he reports a strong commitment to increasing his emotional coping skills.

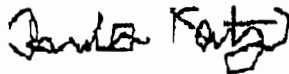
exempt is significantly impacted by both his psychological and physical conditions at this time. Major life activities affected include sleeping, walking, sitting, standing, and social/interpersonal interactions. *exempt* is able to answer phones, input data, operate copier and fax machines with no limitations. He is able to sit for limited time periods (30 minutes to an hour) and requires freedom and flexibility to stretch, to stand or to take a walk depending upon physical pain or intensity of mood lability. Attending, planning and conducting meetings is limited, as *exempt* has significant difficulty coping with others face to face at this time due to disorders identified in Axis II and III. Chronic pain, agitation, fatigue, depressed mood and irritability impact his ability to perform effectively in a work place but he is not limited as significantly by these issues when able to work from home. Performing analytical functions is unlimited and improved when in a home office environment at this time. *exempt* is able to type on a keyboard and for approximately 20-30 words per minute without taking a break.

Sat 18 Apr 2015 07:08:21 PM EDT 3366656188 TRIAD PSYCHIATRIC & COUNSELING CENTER, PPAGE 3 of 3

As his treatment in our practice has just begun, it is unclear the duration of these limitations and how long these accommodations would need to be in place. It is clear that his psychological condition is fragile and severe, and that he is insightful about his physical and emotional conditions. *Rempt* has moderate to severe anxiety, low energy, impaired concentration, and middle insomnia. He is cooperative, well groomed and his speech is clear. *Rempt* is alert, oriented to all spheres, and his affect is congruent and appropriate. He is goal directed and logical. Judgment and insight appear to be good. He denies suicidal or homicidal ideation or intent. Medication for sleep and pain can cause fatigue. Therapy can also emotionally activate patients, and symptoms can increase while medications are being attempted. The pace, intensity and timing of therapy will be considered as *Rempt* continues in treatment.

Please do not hesitate to contact me at the office and I will return your call as soon as possible. I have consent to speak with you via telephone and will provide further documentation as needed.

Sincerely,



Paula Katz

Doc 7



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF CIVIL RIGHTS

April 22, 2015

EPA DETERMINATION OF DISABILITY

In accordance with:

- EPA Order 3110.21 A2 Providing Reasonable Accommodation for EPA Employees and Applicants with Disabilities;
- EPA Procedures for Providing Reasonable Accommodation for Employees and Applicants with Disabilities;
- EEOC Reasonable Accommodation Guidance;
- Rehabilitation Act of 1973, amended; and
- ADA Amendments Act of 2008.

Individual requesting reasonable accommodation:*exempt***Date of reasonable accommodation request:** 1/9/14**Reasonable Accommodation Requested by Employee:**

- Request to work from home for an extended period.

Determination as to whether employee is an individual with a disability:

The Decision-Maker (DM), Deborah Caution, for this employee's request for reasonable accommodation deemed it necessary that sufficient documentation be provided. The following documentation was provided to the National Reasonable Accommodation Coordinator: two (2) documents; one from Christel Keisler, M.D. dated 1/2/15 (received 1/9/15); and one from Paula Katz, LPCS dated 4/17/14 (received 4/20/15).

After careful review of this documents by the National Reasonable Accommodation Coordinator, it is determined that *exempt* has a covered impairment that substantially limits the major life activity of the function of the brain and musculoskeletal system. Therefore, it is determined that this employee is an individual with a disability in accordance with the above indicated Order, Procedures, Statutes and Guidance.

Current limitations imposed on this individual resulting from the current disabling conditions or limitations that may flow from the negative effects of mitigating measures used to treat the current disabling conditions and described in the documentation include:

Can type on a keyboard as long as he does not type more than 20-30 minutes at a time without taking a break; can only sit for limited amounts of time without being able to take a break, stand, stretch; maximum of 30 minutes to 1 hour; walking around and carrying documents for signature would be affected by his condition and the need to limit occupational and social interaction; attending, planning and conducting meetings is limited since he has significant difficulty coping with others face to face at this time due to his condition; his conditions impact his ability to perform effectively in a workplace but he is not limited significantly by these issues when able to work from home; performing analytical functions is unlimited and improved when in a home office environment at this time.

Ms. Katz also adds that it is unclear the duration of these limitations and how long these accommodations would need to be in place.

At this time, it is recommended that the employee and DM meet to explore and discuss what accommodation/s, if any, may be effective based on the above information. **The DM may offer the requested accommodation, the accommodation suggested by the health care professional/s, or an accommodation of the DM's choosing. Any reasonable accommodation offered should address any limitations imposed on the employee. To be an employee with a disability who is qualified, any accommodation being considered must provide the employee with an opportunity to perform the essential duties of his/her current job in a satisfactory manner and does not cause undue hardship on the operation of the office.**

After consultation with the employee and considering the suggested accommodation/s by the health care professional, the DM has the authority to determine what reasonable accommodation/s, if any, will be offered. The accommodation/s provided shall remain in place until such time as it causes undue hardship to the agency, is no longer needed or is no longer effective. If the implemented accommodations are determined to be ineffective, the DM shall consider other accommodations that may be effective. Employees with disabilities shall be held to the same performance standards and must adhere to uniformly applied attendance and conduct standards as all other employees. Although uniformly applied standards shall be adhered to, EEOC clearly states in its Guidance that it is a reasonable accommodation to modify a workplace policy when necessitated by an individual's disability-related limitations, barring undue hardship. I am available to assist the employee and/or the DM with any aspect of this process as well as to investigate possible accommodations.

I have attached, in an email accompanying this letter, Appendix D, Reasonable Accommodation Information Reporting Form. At the appropriate time, this Appendix D shall be

3

completed by the DM, Ms. Caution. The DM shall keep a copy and provide copies to the employee and Eileen Burrows, Acting National Reasonable Accommodation coordinator. Eileen's copy can be sent electronically or via pouch mail to HQ mail stop code 1201A, marked "Confidential." In accordance with the AFGE National Reasonable Accommodation Procedures the DM shall make a decision within five (5) work days from the date of this letter or by 4/29/15, absent any legitimate extenuating circumstances.

Thank you for your cooperation and if you have any questions regarding this matter please contact Eileen at 202-564-7959 or burrows.eileen@epa.gov.

Distribution:

exempt

Deborah Caution, Decision-Maker

Eileen Burrows, Acting National Reasonable Accommodation Coordinator

Kristin Tropp, Assistant Reasonable Accommodation Coordinator

From: *exempt*
 Subject: FW: Reasonable Accommodation
 Date: April 24, 2015 at 12:28 PM
 To: *exempt*

Respectfully,

exempt
 Office of Administration and Policy
 Office of Enforcement and Compliance Assurance
 U.S. Environmental Protection Agency
 MC: 2201A

*further unnecessary
 request. Punitive,
 Questions already
 answered*

"Tell me and I forget. Teach me and I remember. Involve me and I learn." --Benjamin Franklin

From: Caution, Deborah
 Sent: Thursday, April 23, 2015 4:27 PM
 To: Burrows, Eileen; Cooper, Jonathan
 Cc: Tropp, Kristin; *exempt*
 Subject: RE: Reasonable Accommodation
 Importance: High

This message responds to your April 22, 2015 email regarding the reasonable accommodation request submitted by *exempt*. I look forward to working with *exempt* to develop an appropriate accommodation.

As an initial matter, I can gladly accommodate *exempt* need to take breaks from typing and sitting throughout the workday. Therefore, at this time, and based on the information I have, I am deciding to partially grant *exempt* accommodation request. However, in order to make an informed decision about *exempt* request to perform his current duties remotely 100% of the time, I need clarification from his health care provider regarding his ability to perform the following essential job functions:

- Walk around and hand carry documents for signature
- Attend, plan, and conduct meetings

In relevant part, the summary of *exempt* limitations contained in your April 22, 2015 email states that "walking around and carrying documents for signature would be affected by his condition and the need to limit occupational and social interaction; attending, planning and conducting meetings is limited since he *exempt* has significant difficulty coping with others face to face at this time due to his condition."

Clarifying Questions:

1. How many hours per day is *exempt* able to work each day?
2. Is *exempt* able to walk around and hand carry documents for signature for any about of time during the workday?
3. Is *exempt* limitation based on the distance he can walk or carry documents?
4. Does *exempt* "need to limit occupational and social interaction" affect his ability to attend, plan, and conduct meetings, either in person or remotely (via telephone or videoconference)?
5. What is the time limit on the length of meetings he can attend, conduct or plan?
6. How many hours per day is *exempt* able to attend, plan, and conduct meetings in the workplace?
7. Please clarify what is means that *exempt* needs to "limit occupational and social interaction."
8. Can *exempt* interact with customers on a daily basis? If so, for how long each work day?

8. Can *Exempt* interact with customers on a daily basis? If so, for how long each work day?
9. Is *Exempt* limited in his ability to interact with customers and/or co-workers on the telephone or via videoconference?
10. Does *Exempt*'s difficulty coping with others affect his ability to handle time-sensitive matters?
11. What job functions can *Exempt* perform in the work place?

Answers to these questions are critical to my ability to understand what essential job functions *Exempt* is able to perform, particularly because *Exempt* currently performs a customer service-oriented job that involves serving multiple customers, and meeting deadlines that are sometimes imposed on short notice.

As an accommodation, I am willing to extend the temporary accommodation of allowing *Exempt* to telework 100% of the time for an additional 15 calendar days while I await responses to the clarifying questions requested above. As I have mentioned before, this temporary accommodation imposes an undue burden on *Exempt* co-workers. Therefore, the sooner I receive the needed clarification, the sooner I will be able to collaborate with *Exempt* to develop an appropriate accommodation that does not impose an undue burden on others.

Thank you,

d

Deborah A. Caution

Director, Administrative Management Division

Office of Administration and Policy

Office of Enforcement and Compliance Assurance

U.S. Environmental Protection Agency

1200 Pennsylvania Avenue N. W.

Rm. 3240C, Mail Stop 2201A

William Jefferson Clinton Federal Building-South

Washington, DC 20460

Phone: (202)564-1663 Fax: (202) 501-0017

Email: caution.deborah@epa.gov

Respect for Yourself; Respect for Others; Responsibility for all your actions!

From: Burrows, Eileen

Sent: Wednesday, April 22, 2015 10:21 AM

To: Caution, Deborah; *Exempt*

Cc: Tropp, Kristin

Subject: Reasonable Accommodation

Deborah and *Exempt*

Attached, please find two documents. First, is the determination of disability letter and second is Appendix D, Reasonable Accommodation Information Reporting form. At this time, it is suggested that the two of you meet to discuss these documents. At the appropriate time, Deborah Caution, as the Designated Agency Decision maker (DM), shall issue a decision via appendix D. The DM shall keep a copy of Appendix D and forward copies to the employee, the Assistant National Reasonable Accommodation Coordinator, Kristin Tropp, (and me if this is sent before cob 4/23/15). After 4/27/15, please include Jonathan Cooper since he will be the new Acting National Reasonable Accommodation Coordinator. In accordance with the AFGE National Reasonable

Accommodation Procedures, the DM has up to five (5) business days from the date of this notice, or by 4/29/15, to issue a decision, absent any legitimate extenuating circumstance.

Due to the confidential nature of reasonable accommodation as well as the requirements of the Privacy Act, only those persons listed on this email, or others on a "need to know" basis, shall have access to this information or be involved in any discussion related to this employee's request.

I am available to assist either or both of you with any aspect of this process. Please let me know if you have any questions.

Thanks,

Eileen Burrows
Acting National Reasonable Accommodations Coordinator
U.S. Environmental Protection Agency
Office of Civil Rights (Mail Stop: 1201A)
William Jefferson Clinton—North Bldg.
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Phone: 202-564-7959
burrows.eileen@epa.gov



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

JUN 10 2015

ASSISTANT ADMINISTRATOR
FOR ENFORCEMENT AND
COMPLIANCE ASSURANCE

The Honorable Richard Burr
United States Senate
Washington, D.C. 20510

Dear Senator Burr:

Thank you for your April 30, 2015, letter concerning *exempt* an employee of the U.S. Environmental Protection Agency who works as a Management Analyst in my office. You requested information regarding *exempt* request to telework full-time as a reasonable accommodation. I appreciate your interest in this matter and welcome the opportunity to provide information concerning *exempt* request and the EPA's response.

On December 3, 2014, *exempt* requested to work from home full-time as a reasonable accommodation due to medical reasons. On December 17, 2014, the agency requested medical documentation from *exempt* substantiating his need for full-time telework. Between January 2015 and April 2015, *exempt* provided insufficient medical documentation in support of his request; it was during the latter part of this time period that *exempt* contacted your office.

On May 6, 2015, *exempt* provided the agency with complete documentation providing a medical basis for his need for full-time telework. On May 11, 2015, the agency granted *exempt* reasonable accommodation request for full-time telework. Under this arrangement, *exempt* is being held accountable to performing his duties on a full-time basis via email, telephone, and videoconference, as appropriate.

Again, thank you for your letter. If you have any further questions, please contact me or your staff may contact Carolyn Levine in EPA's Office of Congressional and Intergovernmental Relations at levine.carolyn@epa.gov or at (202) 564-1859.

Sincerely,

Cynthia Giles
Cynthia Giles

AL-15-001-0292



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D C 20460

JUN 11 2015

The Honorable Benjamin L. Cardin
United States Senate
Washington, DC 20510

Office of
International and
Tribal Affairs

Dear Senator Cardin:

I want to extend my personal thanks for your very kind introductory remarks today before the Senate Environment and Public Works Committee. I was very honored by your gracious and generous remarks about my service at the Maryland Department of Environment, Chesapeake Bay Foundation and Maryland General Assembly.

I am humbled to be nominated by President Obama to be the Assistant Administrator of International and Tribal Affairs at EPA. And as I said to you today, I truly feel that my many years working in Maryland has enriched and propelled me on this career path.

Many thanks again.

A handwritten signature in black ink, appearing to read "Jane".

Jane Nishida
Principal Deputy Assistant Administrator

AL-15-WO-8262

JOHN MCCAIN
ARIZONA

CHAIRMAN, COMMITTEE ON
ARMED SERVICES
COMMITTEE ON HOMELAND SECURITY
AND GOVERNMENTAL AFFAIRS
COMMITTEE ON INDIAN AFFAIRS

United States Senate

April 17, 2015

Mr. Arvin Ganesan
Associate Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue, NW Room 3246 ARN
Washington, DC 20460-0001

Dear Mr. Ganesan,

I wish to bring to your attention a matter concerning *Exempt* who has encountered a problem.

Because the situation is under your jurisdiction, I am respectfully referring this matter to you for consideration. I feel that this issue would be better addressed by you and request that you respond directly to *Exempt*.

Thank you.

Sincerely,



John McCain
United States Senator

JM/xcf

241 RUSSELL SENATE OFFICE BUILDING
WASHINGTON, DC 20510-0303
(202) 224-2235

2201 EAST CAMELBACK ROAD
SUITE 115
PHOENIX, AZ 85016
(602) 962-2410

122 NORTH CORKLEZ STREET
SUITE 108
PHOENIX, AZ 85001
(602) 443-0833

467 WEST CONGRESS STREET
SUITE 103
PHOENIX, AZ 85001
(602) 670-0334

TELEPHONE FOR HEARING IMPAIRED
(602) 552-0170

Exempt
Exempt
Exempt

Dear Senator John McCain,

I voted for you and respect you tremendously. I'm writing this letter appealing to you for help, I'm a 55 year old mother and grandmother who up to this year was very healthy, I have since been diagnosed with stage 4 ovarian cancer that has spread to my colon, I'm not a picture of health, and now I have been experiencing severe breathing problems, not connected with my cancer, I'm writing to you from a emergency room computer waiting for my ride, they find nothing wrong except shortness of breath and pains in my chest, but I can't breathe and the reason I'm writing you is because I believe that this all stems from the spraying coming from the unmarked planes above my daughters home, where I have gone to be cared for and to be near my grandchildren when I pass. I'm writing you because I lived in North Phoenix Arizona for 13 years. My dearest friend said those are Chemical Trails planes, they omit chemical emissions and leave those nasty streaks in the sky, she has numerous video and pictures of these lines and designs the planes leave behind. I hear them over head and now I have start experiencing severe stuffy nose and labored breathing, pains in my chest. I did notice them a lot in Phoenix where I used to live. But its gotten worse, I love this country I'm no threat I'm so proud to be an American citizen why are they spaying me, I am now am very aware of their presence and feel that this is the reason I can't breathe, my daughter thinks I'm nuts and wants to put me in the crazy home, thank goodness I'm sick and she wouldn't do that to me now, But my friend said that she believes me and wondered why they would do this to me? I'm not a criminal, I'm not a enemy of this country why me, what did I do wrong for them to be doing this to me, I know it sounds so far fetched but I now notice these chem-trails in the sky and notice my symptom's getting worse when I'm exposed to them? Please I'm appealing to you for help I have a nephew who works in homeland security and I was going to ask him if this was possible? Please think of your kids grandmother and how much they love her, why cut my life short when I'm so sick anyway, my father and brother in laws were all veterans who proudly served this country, why single me out and hurt me, my grand children are near me too, breathing this in, they are innocent precious lives and deserve a healthy life, my friend said leave it in God's hand no evil deed goes unpunished, but

15-000-8262

I don't want to die before my time ,please I beg you look into this for me or if you cant help please find someone who can . Thank you and God Bless you and your family. God Bless America and our brave troops . Sincerely , *exempt*
Mineral ,Virginia

15-000-8262



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street

San Francisco, CA 94105-3901

APR 30 2015

Exempt

Dear ,

Exempt

We are in receipt of the letter you addressed to Senator John McCain who forwarded your letter on April 17, 2015, to the United States Environmental Protection Agency's (EPA) San Francisco Regional Office. Senator McCain requested that we respond directly to your concerns regarding the dispersal of aerosols from aircraft in the atmosphere and the health issues you are confronting. We are sorry that you are facing these health issues and sincerely hope you seek out the medical attention and care to address your needs.

The EPA is not aware of any deliberate actions to release chemical or biological agents into the atmosphere. What you describe in your letter are referred to as condensation trails, or "contrails," which are line-shaped clouds composed of ice particles that are visible behind jet aircraft engines under certain atmospheric conditions.

Jet aircraft engines operating at high altitudes emit tiny combustion-related particles from the burning of jet fuel, and water vapor present in the ambient atmosphere reacts with these particles to form contrails. Contrails are about 99 percent frozen water vapor and less than 1 percent combustion-related particles. These contrails spread due to atmospheric turbulence and sometimes join with other contrails and expand into large, natural looking clouds that can cover large areas of the sky. Persistent contrails can last for hours while growing to several kilometers in width and 200 to 400 meters in height.

Aircraft emission standards for gas turbine engines that power civil aircraft have been in place for about 30 years. The EPA sets the emission standards for the engines, and the Federal Aviation Administration enforces the standards. Emission standards apply to essentially all commercial aircraft and address smoke, unburned hydrocarbons, carbon monoxide, and oxides of nitrogen (NOx) for the landing and takeoff cycle. For your reference, enclosed are documents entitled "Aircraft Contrails Factsheet" and "Contrails Facts." We trust that this information will be helpful in responding to your concerns.

Sincerely,

Mike Bandrowski

Mike Bandrowski, Chief
Air Toxics, Radiation and Indoor Air

Enclosures

Cc: Sen. John McCain



Aircraft Contrails Factsheet

Summary

This fact sheet describes the formation, occurrence, and effects of "condensation trails" or "contrails." It was developed by scientific and regulatory experts at the Environmental Protection Agency (EPA), the Federal Aviation Administration (FAA), the National Aeronautics and Space Administration (NASA), and the National Oceanic and Atmospheric Administration (NOAA) in response to public inquiries regarding aircraft contrails. Contrails are line-shaped clouds sometimes produced by aircraft engine exhaust, typically at aircraft cruise altitudes several miles above the Earth's surface. The combination of water vapor in aircraft engine exhaust and the low ambient temperatures that often exists at these high altitudes allows the formation of contrails. Contrails are composed primarily of water (in the form of ice crystals) and do not pose health risks to humans. They do affect the cloudiness of the Earth's atmosphere, however, and therefore might affect atmospheric temperature and climate. The basic processes of contrail formation described in this fact sheet apply to both civil and military aircraft.

What are contrails?

Contrails are line-shaped clouds or "condensation trails," composed of ice particles, that are visible behind jet aircraft engines, typically at cruise altitudes in the upper atmosphere¹. Contrails have been a normal effect of jet aviation since its earliest days. Depending on the temperature and the amount of moisture in the air at the aircraft altitude, contrails evaporate quickly (if the humidity is low) or persist and grow (if the humidity is high). Jet engine exhaust provides only a small portion of the water that forms ice in persistent contrails. Persistent contrails are mainly composed of water naturally present along the aircraft flight path.

How are aircraft emissions linked to contrail formation?

Aircraft engines emit water vapor, carbon dioxide (CO₂), small amounts of nitrogen oxides (NO_x), hydrocarbons, carbon monoxide, sulfur gases, and soot and metal particles formed by the high-temperature combustion of jet fuel during flight. Of these emitants, only water vapor is necessary for contrail formation. Sulfur gases are also of potential interest because they lead to the formation of small particles. Particles suitable for water droplet formation are necessary for contrail formation. Initial contrail particles, however, can either be already present in the atmosphere or formed in the exhaust gas. All other engine emissions are considered nonessential to contrail formation.

¹This fact sheet focuses on contrails produced by aircraft engine exhaust. However, the term "contrail" is also used to refer to the short trails sometimes briefly appearing over aircraft wings or engine propellers, especially under mild, humid conditions. These contrails consist entirely of atmospheric water that condenses as a result of local reductions in pressure due to the movement of the wing or propeller.





Figure 1 Contrails forming behind the engines of a Lufthansa Airbus A310-330 cruising at an altitude of 35,100 ft (10.7 km) as seen from research aircraft (Photo German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt (DLR)), Oberpfaffenhofen, Germany) Inset: Contrails forming behind the engines of a large commercial aircraft. Typically, contrails become visible within roughly a wingspan distance behind the aircraft. (Photo: Masako Imai, Cloud Castle/Photo sky Japan.)

How do contrails form?

For a contrail to form, suitable conditions must occur immediately behind a jet engine in the expanding engine exhaust plume. A contrail will form if, as exhaust gases cool and mix with surrounding air, the humidity becomes high enough (or, equivalently, the air temperature becomes low enough) for liquid water condensation to occur. The level of humidity reached depends on the amount of water present in the surrounding air, the temperature of the surrounding air, and the amount of water and heat emitted in the exhaust. Atmospheric temperature and humidity at any given location undergo natural daily and seasonal variations and hence, are not always suitable for the formation of contrails.

If sufficient humidity occurs in the exhaust plume, water condenses on particles to form liquid droplets. As the exhaust air cools due to mixing with the cold local air, the newly formed droplets rapidly freeze and form ice particles that make up a contrail (See Figure 1). Thus, the surrounding atmosphere's conditions determine to a large extent whether or not a contrail will form after an aircraft's passage. Because the basic processes are very well understood, contrail formation for a given aircraft flight can be accurately predicted if atmospheric temperature and humidity conditions are known.

After the initial formation of ice, a contrail evolves in one of two ways, again depending on the surrounding atmosphere's humidity. If the humidity is low (below the conditions for ice condensation to occur), the contrail will be short-lived. Newly formed ice particles will quickly evaporate as exhaust gases are completely mixed into the surrounding atmosphere. The resulting line-shaped contrail will extend only a short distance behind the aircraft (See Figure 2).

If the humidity is high (greater than that needed for ice condensation to occur), the contrail will be persistent. Newly formed ice particles will continue to grow in size by taking water from the surrounding atmosphere. The resulting line-shaped contrail extends for large distances behind an aircraft (See Figures 2 and 3). Persistent contrails can last for hours while growing to several kilometers in width and 200 to 400 meters in height. Contrails spread because of air turbulence created by the passage of aircraft, differences in wind speed along the flight track, and possibly through effects of solar heating.

What are the ingredients of jet fuel, and are they important to contrail formation?

All jet fuel is a hydrocarbon mixture containing small amounts of impurities and additives. All aircraft jet fuel is analyzed for strict impurity limits before use. The hydrocarbon content of jet fuel produces water vapor as a by-product of combustion. Contrails would not form behind aircraft engines without the water vapor by-product present in exhaust.

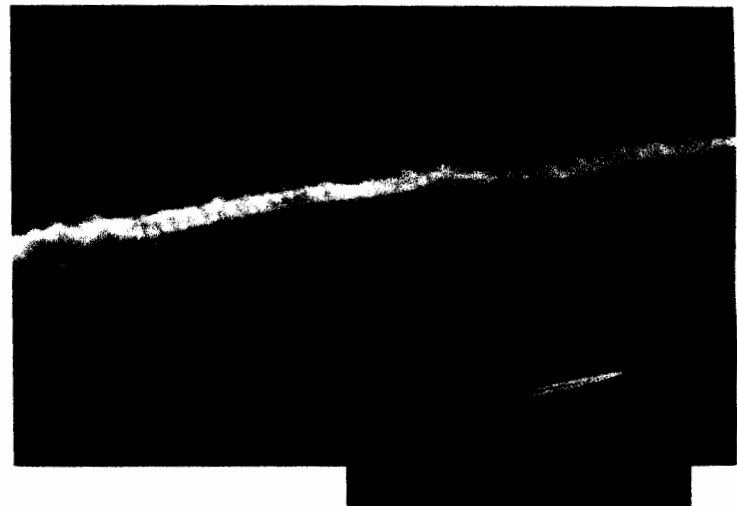


Figure 2 Photograph of two contrail types. The contrail extending across the image is an evolving persistent contrail. Shown just above it is a short-lived contrail. Short-lived contrails evaporate soon after being formed due to low atmospheric humidity conditions. The persistent contrail shown here was formed at a lower altitude where higher humidity was present. Inset: Another example of a short-lived contrail. (Photos: J. Holcek, NOAA Aeronomy Laboratory, Boulder, CO.)



Figure 3. Persistent contrails and contrails evolving and spreading into cirrus clouds. Here, the humidity of the atmosphere is high, and the contrail ice particles continue to grow by taking up water from the surrounding atmosphere. These contrails extend for large distances and may last for hours. On other days when atmospheric humidity is lower, the same aircraft passages might have left few or even no contrails. (Photo: L. Chang, Office of Atmospheric Programs, U.S. EPA)

A common impurity in jet fuel is sulfur (~0.05% by weight), which contributes to the formation of small particles containing various sulfur species. These particles can serve as sites for water droplet growth in the exhaust and, if water droplets form, they might freeze to form ice

particles that compose a contrail. Enough particles are present in the surrounding atmosphere, however, that particles from the engine are not required for contrail formation. There are no lead or ethylene dibromide additives in jet fuel. Additives currently used in jet fuels are all organic compounds that may also contain a small fraction of sulfur or nitrogen.

Why are persistent contrails of interest to scientists?

Persistent contrails are of interest to scientists because they increase the cloudiness of the atmosphere. The increase happens in two ways. First, persistent contrails are line-shaped clouds that would not have formed in the atmosphere without the passage of an aircraft. Secondly, persistent contrails often evolve and spread into extensive cirrus cloud cover that is indistinguishable from naturally occurring cloudiness (See Figure 3). At present, it is unknown how much of this more extensive cloudiness would have occurred without the passage of an aircraft. Not enough is known about how natural clouds form in the atmosphere to answer this question.

Changes in cloudiness are important because clouds help control the temperature of the Earth's atmosphere. Changes in cloudiness resulting from human activities are important because they might contribute to long-term changes in the Earth's climate. Many other human activities also have the potential of contributing to climate change. Our climate involves important parameters such as air temperature, weather patterns, and rainfall. Changes in climate may have important impacts on natural resources and human health. Contrails' possible climate effects are one component of aviation's expected

overall climate effect.

Another key component is carbon dioxide (CO₂) emissions from the combustion of jet fuel.

Increases in CO₂ and other "greenhouse gases" are expected to warm the lower atmosphere and Earth's surface. Aviation's overall potential for influ-

encing climate was recently assessed to be approximately 3.5 percent of the potential from all human activities (See Box 1).

Persistent line-shaped contrails are estimated to cover, on average, about 0.1 percent of the Earth's surface (Sausen et al., 1998; see Figure 4). The estimate uses:

- meteorological analysis of atmospheric humidity to specify the global cover of air masses that are sufficiently humid (low enough atmospheric temperature) for persistent contrails to form
- data from 1992 reported aircraft operations to specify when and where aircraft fly
- an estimated average for aircraft engine characteristics that affect contrail formation
- satellite images of certain regions of the Earth in which contrail cover can be accurately measured (See Figure 5)

The highest percentages of cover occur in regions with the highest volume of air traffic, namely over Europe and the United

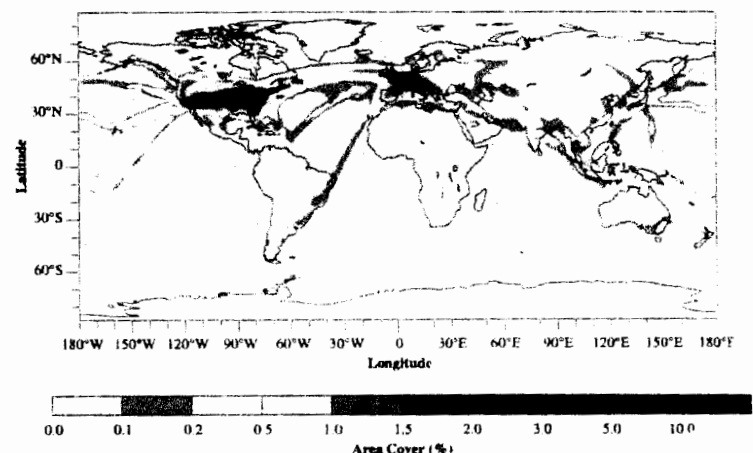


Figure 4. Estimated global persistent contrail coverage (in percent area cover) for the 1992 worldwide aviation fleet. The global mean cover is 0.1 percent. See text for description of how this estimate was made. (Reproduced with permission from Sausen et al., 1998, Figure 3, left panel.)

States (See Figure 4). This estimate of contrail cloudiness cover does not include extensive cirrus cloudiness that often evolves from persistent line-shaped contrails. Some evidence suggests that this additional cirrus cloudiness might actually exceed that of line-shaped cloudiness.

How is contrail coverage expected to change in the future?

Contrail cover is expected to change in the future if changes occur in key factors that affect contrail formation and evolution. These key factors include aircraft engine technologies that affect emissions and conditions in the exhaust plume; amounts and locations of air traffic; and background atmospheric humidity conditions. Changes in engine fuel efficiency, for example, might change the amount of heat and water emitted in the exhaust plume, thereby affecting the frequency and geographical cover of contrails. Changes in air

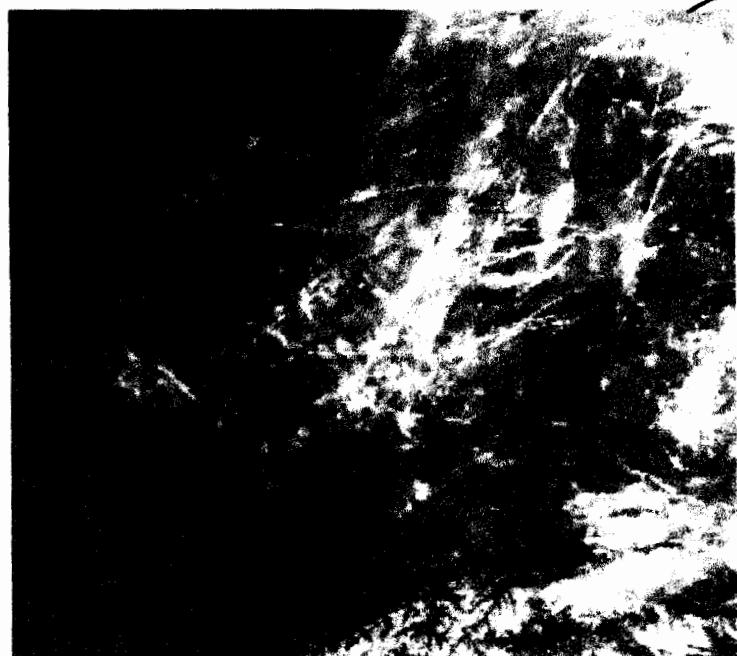


Figure 5 Satellite photograph showing an example of contrails covering central Europe on May 4, 1995. The average cover in a photograph is estimated by using a computer to recognize and measure individual contrails over geographical regions of known size. Photograph from the National Oceanic and Atmospheric Administration (NOAA)-12 AVHRR satellite and processed by DLR (adapted from Mannstein et al., 1999). (Reproduced with permission of DLR.)

traffic might also affect persistent contrail formation. It is currently estimated that regions of the atmosphere with sufficient humidity to support the formation of persistent contrails cover about 16 percent of the Earth's surface. If air traffic in these regions increases in the future, persistent line-shaped contrail

BOX 1



Scientific Assessment of the Global Atmospheric Effects of Aviation



The Intergovernmental Panel on Climate Change (IPCC) was established by the World Meteorological Organisation (WMO) and the United Nations Environment Programme (UNEP) in 1988 to assess the science, technology, and socioeconomic information needed to understand the risk of human-induced climate change. The 1999 IPCC report, "Aviation and the Global Atmosphere," (see References) describes current knowledge regarding aircraft effects on the global atmosphere. The report was compiled by more than 100 authors from 18 countries. Technical experts from the aviation industry, including airlines and airframe and engine manufacturers, worked with atmospheric scientists in creating this report.

The report considers all gases and particles emitted by aircraft into the upper atmosphere. It also examines the

role these gases and particles play in modifying the atmosphere's chemical properties and initiating the formation of contrails and cirrus clouds. Chapter 3 of the IPCC report provides detailed information about contrail formation, occurrence, and persistence. The report also considers how potential changes in aircraft technology; air transport operations; and the institutional, regulatory, and economic framework might affect emissions in the future. It does not address the effects of engine emissions on local air quality near the surface or potential human health effects of engine emissions. The report notes that significant scientific uncertainty is associated with aviation's predicted influence on climate. A report summary is available from the IPCC Web site at <www.ipcc.ch>.

cover there will also increase. Overall, based on analysis of current meteorological data and on assumptions about future air traffic growth and technological advances, persistent contrail cover is expected to increase between now and the year 2050.

Are persistent contrails harmful to the public?

Persistent contrails pose no direct threat to public health. All contrails are line-shaped clouds composed of ice particles. These ice particles evaporate when local atmospheric conditions become dry enough (low enough relative humidity). The ice particles in contrails do not reach the Earth's surface because they fall slowly and conditions in the lower atmosphere cause ice particles to evaporate.

Contrail cloudiness might contribute to human-induced climate change. Climate change may have important impacts on public health and environmental protection.

Do authorities regulate aircraft emissions?

In the United States, some aspects of aviation emissions are regulated through the efforts of several government agencies. The U.S. Environmental Protection Agency (EPA), under the Clean Air Act (CAA) of 1970, has established commercial aircraft engine exhaust emissions standards for certain emittants associated with ground-level air pollution. Jet engine exhaust contains, among other emittants, oxides of nitrogen (NO_x) and hydrocarbons that contribute to ozone formation. Jet aircraft are one of many sources of these pollutants. Ozone is a prime ingredient of smog in and near cities and other areas of the country. While EPA establishes emissions standards for aircraft, the Federal Aviation Administration (FAA) of the U.S. Department of Transportation (DOT) administers and enforces these standards. This domestic framework for regulating aircraft engine emissions is more fully described in Box 2. Currently, there are no regulations addressing contrails and their atmospheric effects.

BOX 2

U.S. Environmental Regulatory Framework for Aircraft Engine Emissions

The Clean Air Act (CAA) directs the U.S. Environmental Protection Agency (EPA) to establish aircraft and aircraft engine emissions standards for any air pollutant that could reasonably endanger public health and welfare. In 1997, EPA aligned U.S. emissions standards (40 CFR Part 87) with engine emissions standards and recommended practices (SARPs) prescribed by the International Civil Aviation Organization (ICAO), a United Nations agency established in 1944 that develops SARPs using the technical support of member states and the aviation community. The United States is an active member of ICAO's Committee on Aviation Environmental Protection, which is responsible for further development of engine emissions standards. In establishing U.S. emissions standards, EPA must consult with the Department of Transportation (DOT) to ensure such regulations' effective dates permit the development

of requisite technology, giving appropriate consideration to compliance cost. It must also consult with DOT concerning aircraft safety before promulgating emissions standards.

Under the CAA, DOT is responsible for enforcing standards established by EPA. DOT delegated enforcement responsibility to the Federal Aviation Administration (FAA). FAA has issued regulations administering and enforcing the emissions standards that apply to civil airplanes powered by gas turbine engines. FAA ensures compliance with these regulations by reviewing and approving certification test plans, procedures, test reports, and engine emissions certification levels. For more information on aircraft emissions or to access EPA's or FAA's aircraft regulations, visit the Aviation Emissions Website of EPA's Office of Transportation and Air Quality at <www.epa.gov/otaq/aviation.htm>.

For further information

Further scientific information about the effects of aircraft on the upper atmosphere can be found in the 1999 IPCC report, "Aviation and the Global Atmosphere" (see References). Information about aircraft and aircraft engine emissions regulations can be found at EPA's aviation emissions Web site, <www.epa.gov/otaq/aviation.htm>. Information about military aircraft and military space launch activities, and their atmospheric and environmental effects, can be found at <http://xre604.brooks.af.mil/safmiq/esoh_issues.htm>. For additional copies or further information on this fact sheet, contact the EPA Stratospheric Protection Hotline at 800 296-1996.

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United States
Environmental Protection Agency
(6205J)
Ariel Rios Building
1200 Pennsylvania Avenue, NW.
Washington, DC 20460
Official Business
Penalty for Private Use \$300



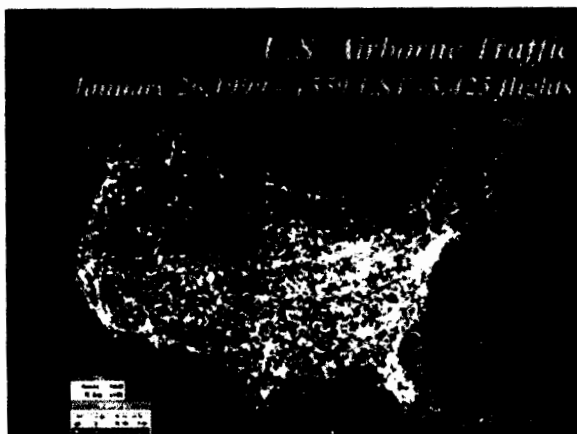
CONTRAILS FACTS

The Air Force operates many aircraft and space systems that are constantly interacting with the environment. Atmospheric interactions such as exhaust gases forming contrails, chaff and flares deployment that produce smoke, aerial pest or weed control spraying, or in-flight emergency fuel releases usually have very minor environmental impacts over a very limited geographical area. This site provides basic information and links about contrails, aircraft and space launch exhaust emissions, chaff and flares, aerial spraying, in-flight emergency procedures, and related topics.

Aircraft, engines, chaff, and flares can produce a variety of condensation patterns (or contrails), exhaust plumes, vapor trails, or smoke patterns. The exhaust emissions produced by aircraft and space launch vehicles can produce contrails that look very similar to clouds which can last for only a few seconds or as long as several hours. Vapor trails are formed only under certain atmospheric conditions and create a visible atmospheric wake similar to a boat propeller in water and usually dissipate very rapidly. Chaff and flares produce unique smoke patterns that are visibly different than a contrail but have the same color and appearance as a cloud but which also typically dissipates very quickly. Aerial spraying for pest or weed control and fire suppression are the only Air Force activities which involve aircraft intentionally spraying chemical compounds (insecticides, herbicides, fire retardants, oil dispersants). In the case of an in-flight emergency, jet fuel may be released to lighten the landing weight and minimize the risk of fire if the aircraft should crash.

Background

The US military has played a significant historical role in the development of aircraft and space launch vehicles, airspace management, environmental management, and public land management procedures. In the earliest years of aviation and rocketry and up through the late 1980s, the military owned and operated the majority of the United States aircraft and space launch fleets. Since the end of the 1991 Persian Gulf War, the USAF has been in a drawdown and restructuring mode. In 1990, there were approximately 9,059 aircraft in the Air Force inventory and approximately 6,126 aircraft in 2000. Of the approximately 6,228 aircraft in the USAF fleet in 1998, 4,447 were assigned to active duty Air Force installations and 1,781 were assigned to Guard and Reserve units, usually co-located at municipal airports. For a more detailed discussion on the changing nature of military and civilian aviation, see A Review Of Military Aviation And Space Issues at <http://www.felsef.org/dec99.htm>.



In the 1980s, commercial airline passenger service and satellite telecommunication growth resulted in an increase in civil aircraft and space booster fleets with numbers almost equivalent to the military (total of all services). Future projections for the next 15 years indicate that commercial aviation and space launch fleets will become larger than the military fleet.

The civil aviation fleet is projected to grow from 12,281 aircraft in 1997 to 25,998 in 2017. The assumptions on growth rates and types of

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aircraft are dependent on many changes in air traffic control, airspace management, and economic growth, but the general trend for civil aviation is increasing capacity by adding more frequent flights with smaller regional jets.

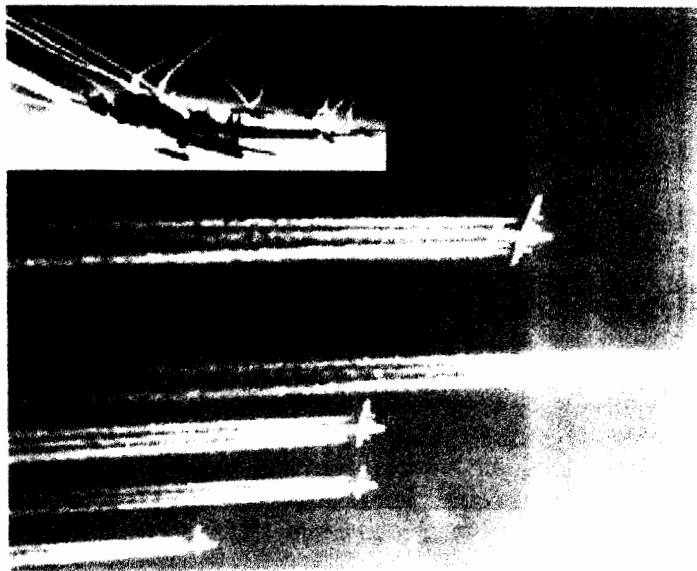
Aircraft fly along specific routes and corridors called the National Airspace System (NAS). The NAS is comprised of the air navigation routes and infrastructure across the United States that supports approximately 60,000 daily flights of commercial, general aviation, and military flights. The FAA is the lead federal agency charged with the operations and maintenance of the NAS. They manage over 5-million square miles of land routes and 23-million square miles of oceanic routes. The FAA must balance the safety and efficiency of the NAS on a daily basis. Many agencies and organizations are involved with the National Airspace System for a variety of purposes: civil air carriers, general aviation, military services, and research organizations. A typical snapshot of daily aircraft operations in the United States is shown below.

In the last ten years, there has been tremendous growth in the number of aircraft operated around the world. The majority of aircraft seen overhead are civilian flights, particularly near large cities. For a more detailed description of the NAS, see A Review Of Military Aviation And Space Issues: Aerospace And Airspace (Part II) at <http://www.felsef.org/jan00.htm>.

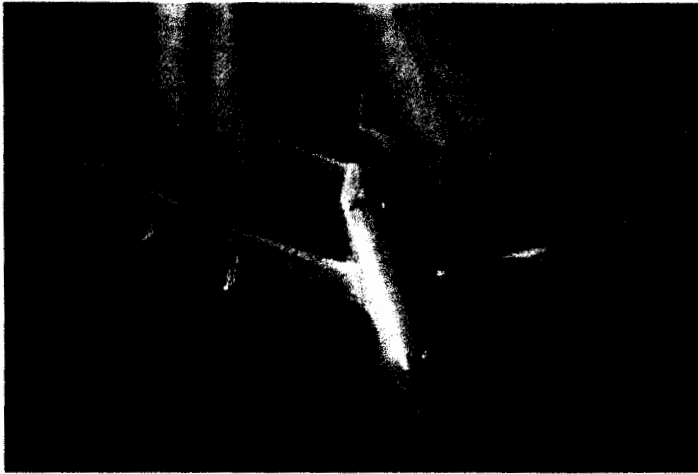
Condensation Trails ("contrails") from Aircraft Engine Exhaust

Contrails (short for "condensation trails") are line-shaped clouds sometimes produced by aircraft engine exhaust. The combination of high humidity and low temperatures that often exists at aircraft cruise altitudes allows the formation of contrails. Contrails are composed primarily of water (in the form of ice crystals) and do not pose health risks to humans. Contrails have been a normal effect of aviation since its earliest days. Depending on the temperature and the amount of moisture in the air at the aircraft altitude, contrails can either

evaporate quickly or they can persist and grow. Engine exhaust produces only a small portion of the water that forms ice in persistent contrails. Persistent contrails are mainly composed of water naturally present along the aircraft flight path.



Aircraft engines emit water vapor, carbon dioxide (CO₂), small amounts of nitrogen oxides (NO_x), hydrocarbons, carbon monoxide, sulfur gases, and soot and metal particles formed by the high-temperature combustion of jet fuel during flight. Of these emittants, only water vapor is necessary for contrail formation. Sulfur gases are also of potential interest because they lead to the formation of small particles. Particles suitable for water droplet formation are necessary for contrail formation. Initial contrail particles, however, can either be already present in the atmosphere or formed in the exhaust gas. All other engine emissions are considered nonessential to contrail formation.



For a contrail to form, suitable conditions must occur immediately behind a jet engine in the expanding engine exhaust plume. A contrail will form if, as the exhaust gases cool and mix with surrounding air, the humidity becomes high enough (or, equivalently, the air temperature becomes low enough) for liquid water to condense on particles and form liquid droplets. If the local air is cold enough, these newly formed droplets then freeze and form ice particles that make up a contrail. Because the basic processes are

very well understood, contrail formation for a given aircraft flight can be accurately predicted if atmospheric temperature and humidity conditions are known.

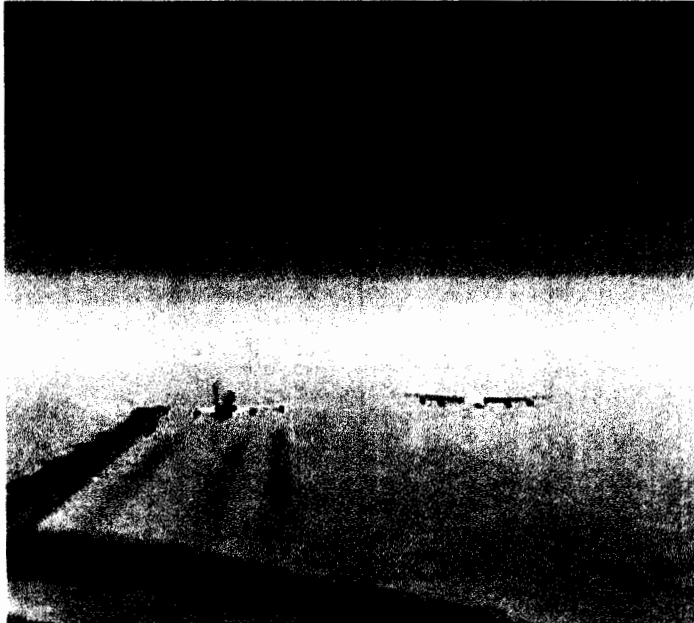
After the initial formation of ice, a contrail evolves in one of two ways. If the humidity is low, the contrail will be short-lived. Newly formed ice particles will quickly evaporate. The resulting contrail will extend only a short distance behind the aircraft. If the humidity is high, the contrail will be persistent. Newly formed ice particles will continue to grow in size by taking water from the surrounding atmosphere. The resulting line-shaped contrail extends for large distances behind an aircraft. Persistent contrails can last for hours while growing to several kilometers in width and 200 to 400 meters in height. Contrails spread because of air turbulence created by the passage of aircraft, differences in wind speed along the flight track, and possibly through effects of solar heating.

Thus, the surrounding atmosphere's conditions determine to a large extent whether or not a contrail will form after an aircraft's passage, and how it evolves. Other factors that influence contrail formation include engine fuel efficiency, which affects the amount of heat and water emitted in the exhaust plume.



Contrails become visible roughly about a wingspan distance behind the aircraft. Contrails can be formed by propeller or jet turbine powered aircraft. During WWII, large formations of bombers left strikingly remarkable contrail formations. Typical contrails are shown below.

The contrails formed by the exhaust at high altitude are typically white and very similar to cirrus clouds. As the exhaust gases expand and mix with the atmosphere, the contrail diffuses and spreads. It is very difficult to distinguish aged contrails from cirrus clouds. It is very difficult to distinguish aged contrails from cirrus clouds. At sunsets, these contrails can be visibly eye-catching and striking as they reflect the blue, yellow, and red spectrum of the reflected sunlight.



Persistent contrails are of interest to scientists because they affect the cloudiness of the atmosphere. Scientists in the United States, Europe, and elsewhere have studied contrail formation, occurrence, and persistence, and research efforts on these topics continue. Shown below is a photo taken from the research aircraft Falcon of the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt (DLR) at about flight level 33,300 feet of an Airbus A340 with contrails (left) and a Boeing 707 without contrails (right). This illustrates a scientific effort to evaluate the effects of different engine characteristics on contrail formation.

The Air Force uses a Boeing 707 airframe for the KC-135 refueling and E-3 AWACS aircraft. The KC-135 fleet is in the process of upgrading to newer engines which produce fewer emissions and noise. Scientific research on contrails was recently summarized by an international group of experts. This summary can be found in Chapter 3 of the report, "Aviation and the Global Atmosphere," published in 1999 by Cambridge University Press for the Intergovernmental Panel on Climate Change (IPCC). The report describes current knowledge regarding the effects of aircraft emissions on the global atmosphere. The full report is available from Cambridge University Press and a summary of this report is at www.ipcc.ch.

Wingtip Condensation Trails



A different type of contrail or condensation trail is caused when a wing surface or winglet causes a cavitation of air in very humid conditions. This results in a unique vapor trail that is not formed due to exhaust gases. The next time you fly in a commercial aircraft through a rain cloud, look for the vapor trails that form over and around the wing. Typical fighter wingtip contrails are shown below.

Exhaust Gases and Emissions

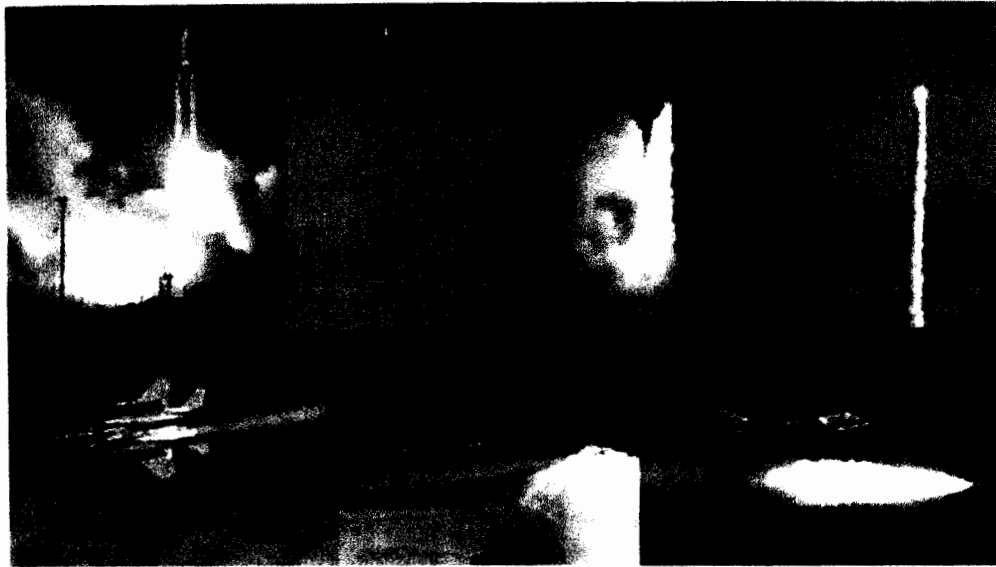
Often, military aircraft can be seen taking off with a black smoke appearing from the engines. This smoke is mainly soot particles, similar to diesel engines. Commercial aircraft also produce the same type of soot particles, but usually not to the same degree as military aircraft. This is for two reasons: the type of fuel and the type of engines.

Most military aircraft use JP-8 jet fuel which is a blend of commercial Jet Aviation Fuel -1 (or Jet A-1) with three extra additives. The additives are used to control ice formation, control biogrowth (molds and slimes), and inhibit corrosion. The military uses these additives because of the unique environments the military operates in, the type of self-sealing fuel tanks used, and the type of metals, plastics, and sealant used on military aircraft. Several specialized aircraft like the SR-71 and U-2 use different fuels than JP-8, but are developed from the same base stock. Fuels research is always ongoing. The newest fuel being brought into production is JP-8+100. Dubbed JP-8+100 because the additive package can increase the thermal stability of military fuel by 100 degrees Fahrenheit, the improved fuel helps prevent gums and deposits that can foul fuel lines.

Military engines are also designed with different performance characteristics than commercial aircraft. Military aircraft and engines also tend to be older and less efficient than commercial aircraft and produce more emissions. Engines are optimized for fuel consumption and power rates at a particular cruising altitude. At take-off, the engines are usually very inefficient and produce more emissions than when at the optimal cruising altitude. Older military aircraft like the B-52 and C-130 can leave a black smoke exhaust even at cruising altitude, while aircraft like the KC-135R with new engines produce an invisible exhaust plume. Typical pictures of aircraft exhaust emission are shown below.



Space launch vehicles and missiles produce a different type of exhaust than aircraft. The propulsion system on military rockets and missiles is usually made of solid rocket fuel. Missiles and rockets produce smoke plumes as a result of the solid fuel burning. The hot gases escaping from the motor can also create contrails, but the smoke and contrail combine to form a single exhaust plume. For more information on Air Force propulsion and fuels programs, see the Air Force Research Laboratory Propulsion Directorate at <http://www.pr.afrl.af.mil/>.



Chaff and Flares

Chaff and flares are defensive counter measures used on aircraft to confuse radar and heat seeking missiles. Chaff is used as a decoy for radar seeking missiles and is made of glass silicate fibers with an aluminum coating. The fibers are approximately 60% glass fiber and 40% aluminum by weight. The typical Air Force RR-188 chaff bundle contains about 150 g of chaff or about 5 million fibers. The fibers are 25 microns in diameter and typically 1 to 2 cm in length. In 1997, the Air Force used about 1.8 million bundles worldwide.

The amount of chaff released worldwide by all of the services is approximately 500 tons per year. Chaff falls to the earth at a settling velocity of approximately 30 cm per second. Atmospheric residence times range from 10 minutes for the majority of chaff released at 100 m to approximately 10 hours for chaff released at 10,000 feet. Chaff fibers experience little breakup before reaching the ground.

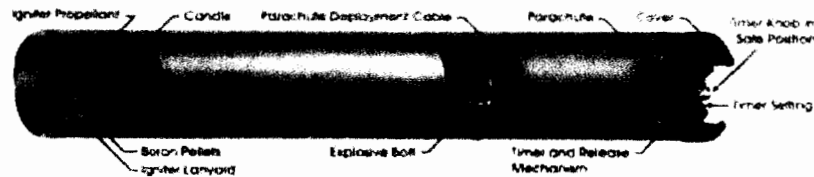
After the chaff is ejected from the aircraft and into the aircraft slipstream, the chaff packages burst open and the fibers scatter to form a radar-reflective cloud called a chaff corridor. Each chaff package is designed to simulate an aircraft. Several aircraft can create a chaff curtain, consisting of thousands of false targets, which confuse the radar guidance package on a missile so they are unable to locate the real targets within the chaff cloud.

Virtually all chaff fibers are 10-100 times larger than PM10 and PM2.5, the air particulates of concern for public health. The primary fiber size is usually too large to be inhaled by livestock, but if they are inhaled they do not penetrate far into the respiratory system and can be easily cleared out. The possible nutritional effects due to chaff ingestion and the risk is minimal to nil for both humans and livestock, considering the chemical composition of chaff (essentially identical to soil) and low chaff loading on the environment. Chaff decomposing in water has no adverse impacts on water chemistry or aquatic life.

Flares are of two types: decoy flares that protect aircraft from infrared missiles, and ground illumination flares. Decoy flares are typically made of magnesium that burns white-hot and are designed to defeat a missile's infrared (IR) tracking capability. The intense heat of the

pyrotechnic candle consumes the flare housing. Common aerial flares are: ALA-17/B, M-206, MJU-2, MJU-7 A/B, MJU-10/B, MJU-23/B, and RR-119.

Ground illumination flares, are designed to descend by parachute and provide up to 30 minutes of illumination of ground targets or activities. Typical flares are the LUU-1, LLU-5, and LLU-2B. A typical LLU-2B sectional is shown below.



The ground illumination flare enhances a pilot's ability to see targets while using Night Vision Goggles (NVGs). Flares burn at uneven rates and fluctuate in brightness and are not used as frequently as in the past as the intense light interferes with the newer NVGs more sensitive sensors.

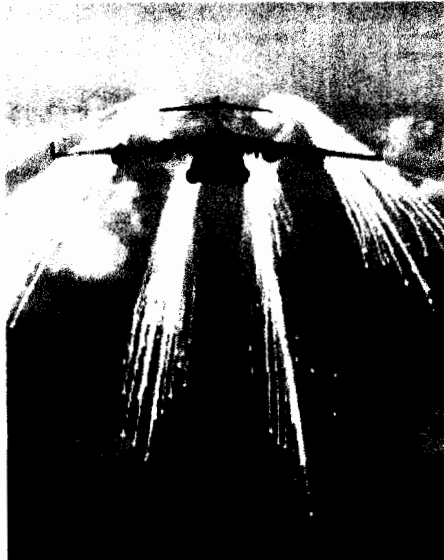
The composition and materials of flares used by the military are similar to standard flares used for aerial, highway and marine purposes. (Skyline). While unburned decoy flares falling from high altitude could be dangerous, flares are designed to burn up during the descent (even the aluminum casing is burned).

Chaff and flares are deployed on most Air Force aircraft from a common MJU-11 Chaff/Flare magazine that is integrated with the warning receiver (a device that alerts the aircraft a missile has locked onto the aircraft). The magazine has a capacity of 30 RR-188 or 30 M-206 flares.

A very thorough independent description of military systems, equipment, and capabilities is published by the American Federation of Scientists.

Typical chaff and flare deployments and patterns are shown in the following pictures.





Aerial Spraying

There are some specific uses of commercial, private, and military aviation where chemicals are introduced in the atmosphere. The most common association of aerial chemical release is spraying for insects, either as crop dusting or mosquito prevention measures. These activities are typically performed at low altitude levels and produce a mist spray that drops to the earth's surface.



The only unit in the Air Force capable of aerial spray operations to control disease-carrying pests and insects is the AFRC's 910th Airlift Wing, Youngstown-Warren Air Reserve Station, Ohio (<http://www.afrc.af.mil/units/910aw/default.htm>). The aerial spray mission uses four specially configured C-130 Hercules shown below. Aerial spraying enables large parcels of land or water to be treated safely, quickly, accurately, and cheaply. This is the only fixed wing aerial-spray capability in the Department of Defense.



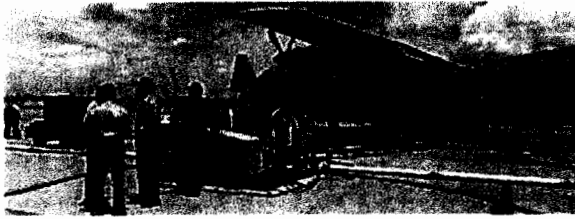
The mission started back in World War II, when legions of American GIs fell victim to malaria and dengue fever, diseases spread by mosquitoes. The mission was taken over from the active force in 1973. Although most of the unit's missions are initiated by the Department of Defense, its services are also requested by local, state and other federal agencies and coordinated the Center for Disease Control. The most common missions flown are for mosquito, sand flea and weed control. Several states have also requested support to combat grasshoppers and locusts. Aerial spray missions have been flown in Puerto Rico, Panama, Guam and the Azores.

The chemical compounds used for mosquito control are EPA controlled and the Air Force uses two primary brands; Dibrom and Anvil 10+10. Dibrom is manufactured by AMVAC Chemical Corporation and is classified as a Naled compound. Naled is an organophosphate insecticide that has been in use since 1959. It is used primarily for controlling adult mosquitoes but is also used on food and food crops, greenhouses and pet flea collars. Naled is applied using Ultra-Low Volume sprayers which dispense very fine aerosol droplets which kills the adult mosquito on contact. Naled is applied at a maximum aerial spray rate of 0.8 ounces of active ingredient per acre. Anvil 10+10 is manufactured by Clarke Mosquito Control Products, Inc and is a Sumithren, also known as a Synergized Synthetic Pyrethroid. Anvil 10+10 is applied using Ultra-Low Volume sprayers at a maximum aerial spray rate of 0.62 ounces of active ingredient per acre.

The chemical compounds used for herbicide weed control are EPA controlled and the Air Force uses Dupont Krovar I DF and Dow Agro Sciences Tordon K. Krovar I DF comes in granular form, is mixed with water and applied as an aerosol to control annual weeds at a rate of 4-6 pounds mixed with 40-100 gallons of water per acre. Tordon K is used as a herbicide to control broadleaf weeds, woody plants, and vines on non-crop areas such as forest planting sites, industrial manufacturing sites, rights-of-way such as electrical power lines, communications lines, pipelines, roadsides, railroads, and wildlife openings. Tordon K is applied at a maximum of 2 quarts per acre.

The 910th Airlift Wing has formed an Oil Dispersant Working Group, and is working with industry and government agencies to test aerial spray methods of controlling major offshore oil spills in coastal waters of the United States. The unit has six Modular Aerial Spray Systems (MASS) and four aircraft modified to accept the MASS. Each MASS has a 2,000 gallon capacity and flow rate are set at 232 gallons per minute. The aircraft flies at 200 Knots Ground Speed at about 100 feet which covers a swath width of 100 feet for an average application rate of flow rate of 5 gallons per acre (variable 3-15 gallons per acre). Total spray-on time for 2,000 gallons lasts about 8 minutes and 30 seconds.

Photographs which show military aircraft with sprays coming from unusual locations on the aircraft are usually re-touched photos (a process that is easy to create using common computer programs).

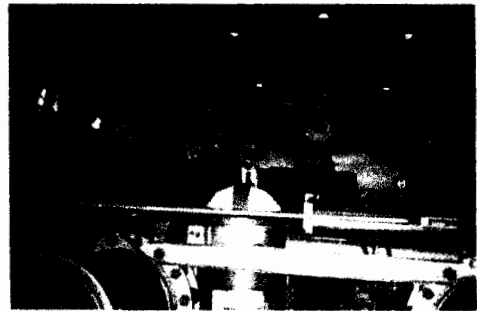


Cloud Seeding and Fire Suppression

For a number of years commercial companies have been involved in cloud seeding and fire suppression measures. Cloud seeding requires the release of chemicals in the atmosphere in an effort to have water crystals

attach themselves and become heavy enough to produce rain. The Air Force does not have a cloud seeding capability.

Fire suppression involves dumping chemicals onto a fire using cargo-type aircraft or helicopters. The 731st Airlift Squadron assigned to the 302nd Airlift Wing, Peterson Air Force Base, CO., is trained in the use of modular airborne fire fighting systems that help firefighting efforts of the U.S. Forest Service by dropping retardant chemicals directly onto fires. The unit's C-130s are loaded with a system designed to airdrop fire-retardant chemicals used in fighting forest fires and fertilizing the forest to generate quick regrowth. The 302nd AW has conducted firefighting response in Colorado, California, Oregon and Idaho.



U.S. forest fires generally occur in desolate, almost inaccessible geographical areas. The U.S. Forest Service turned to air power to help its ground fire fighting units quickly contain and suppress these fires. Over the years, the forest service has developed a highly effective air-attack organization and air tanker fleet to deal with the forest fire emergency.

In 1970, however, numerous catastrophic forest fires erupted in southern California, severely overloading the air tanker fleet's ability to cope with them all. This led to several U.S. Congressmen requesting the U.S. Air Force help the forest service by making military aircraft available as a back-up measure. This in turn led to the development of the Modular Airborne Fire Fighting System (MAFFS). The system is designed to quickly adapt military C-130 aircraft from a military role to a fire-suppression role.

Since 1974, the U.S. Air Force Reserve and Air National Guard units strategically located near high-incident forest fire areas have been equipped with these MAFFS units, and have sent selected aircrews to the aircrew training school for instruction in forest service air operations and procedures.

The MAFFS System is a modular, reusable airborne system for deploying water and fire retardant chemicals from aircraft in flight. It



consists of seven airborne modules and one ground air compressor module. The system can be loaded on a C-130 aircraft in two hours, and filled with retardant and compressed air in 15 to 20 minutes. The system is self-contained and requires no aircraft modifications. Each system weighs 10,500 pounds empty, and has a capacity of 2,700 gallons.

The entire load of retardant is discharged over a fire in 6 to 8 seconds.

Other AFRC aircraft shuttle Forest Service personnel and equipment to fire areas when the emergency requires a swift deployment to the fire line. This increased mobility allows more efficient use of Forest Service resources.

In-flight Emergency Fuel Release

Another common, but infrequent, procedure is the release, or venting, of fuel as a safety measure. If an in-flight emergency (IFE) is declared, a pilot will want to land the aircraft with as light a load as possible to prevent the possibility of damaging the aircraft and/or causing a fuel leak on landing. In order to lighten the fuel load a pilot can continue to fly until the fuel is burned or vent the fuel into the atmosphere. Fuel that is released, or vented, typically atomizes into a fine spray as it is released and typically evaporates before it reaches the ground. JP-8 jet fuel released at low altitudes appears as a fine mist and may not volatilize before reaching the ground surface. The release of fuel does not produce a contrail and appears more like a smoke pattern that dissipates quickly.

The "Chemtrail" Hoax

A hoax that has been around since 1996 accuses the Air Force of being involved in spraying the US population with mysterious substances and show various Air Force aircraft "releasing sprays" or generating unusual contrail patterns. Several authors cite an Air University research paper titled "Weather as a Force Multiplier: Owning the Weather in 2025" (<http://www.au.af.mil/au/database/research/ay1996/acsc/96-025ag.htm>) that suggests the Air Force is conducting weather modification experiments. The purpose of that paper was part of a thesis to outline a strategy for the use of a future weather modification system to achieve military objectives and it does not reflect current military policy, practice, or capability.

The Air Force's policy is to observe and forecast the weather. The Air Force is focused on observing and forecasting the weather so the information can be used to support military operations. The Air Force is not conducting any weather modification experiments or programs and has no plans to do so in the future.

The "Chemtrail" hoax has been investigated and refuted by many established and accredited universities, scientific organizations, and major media publications.

Claims and Facts

Claim: Long-lasting contrails are something new and they have abnormal characteristics.

Fact: Contrails can remain visible for very long periods of time with the lifetime a function of the temperature, humidity, winds, and aircraft exhaust characteristics. Contrails can form many shapes as they are dispersed by horizontal and vertical wind shear. Sunlight refracted or reflected from contrails can produce vibrant and eye-catching colors and patterns. Observation and scientific analysis of contrails and their duration date back to at least 1953.

Claim: Grid patterns of contrails in the sky are evidence of a systematic spraying operation.

Fact: The National Airspace System of the United States is orientated in an east-west and north-south grid with aircraft flying at designated 2000 foot increments of elevation. Contrails formed by aircraft may appear to form a grid as the winds disperse the contrails. More contrails are seen in recent years due to the growth in the civil aviation market. The FAA is responsible for the NAS and Air Force aircraft operate under the same rules and procedures as civilian aircraft when using the NAS.

Claim: There are reported outbreaks of illness after the appearance of "Chemtrails"

Fact: There is no such thing as a "Chemtrail". Contrails are safe and are a natural phenomenon. They pose no health hazard of any kind. If there are massive outbreaks of illnesses, your local health department should be able to tell you if it is an abnormal event. Local health departments generally network together when they start seeing problems. If there is a problem, the CDC will get involved.

Claim: Samples taken have shown the presence of the "DOD patented" bacteria pseudomonas fluorescens.

Fact: The bacteria claimed to be DOD developed and patented is actually a common, naturally occurring bacteria. The U.S. Patent Office (www.uspto.gov) lists 181 patents involving pseudomonas fluorescens, none of which are held by DOD.

Links to Related Sites

- FAA Office of Aviation Research – <http://research.faa.gov/aar/>
- FAA Office of Environment and Energy – <http://aee.hq.faa.gov/>
- DOT Bureau of Transportation Statistics – <http://www.bts.gov/>
- Center For Disease Control and Prevention – <http://www.cdc.gov/>
- EPA Office of Pesticide Programs – <http://www.epa.gov/pesticides>
- International Civil Aviation Organization – <http://www.icao.int/>
- Air Transport Association – <http://www.air-transport.org/>
- Aerospace Industries Association – <http://www.aia-aerospace.org/>
- Federation of American Scientists – <http://www.fas.org/Index.html>
- General Electric Aircraft Engines – <http://www.geae.net/>
- Pratt and Whitney Aircraft Engines – <http://www.pratt-whitney.com/engines/>
- Rolls-Royce Aircraft Engines – <http://194.128.225.11/defence/milp001.htm>

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Layman's Library

Contrails - Contrails, or condensation trails, are "streaks of condensed water vapor created in the air by an airplane or rocket at high altitudes."(Webster's Dictionary). Contrails are the result of normal emissions of water vapor from jet engines. At high altitudes, water vapor condenses and turns into a visible cloud. Contrails form when hot humid air from jet engines mixes with the surrounding air in the atmosphere which is drier and colder. The mixing is a result of turbulence generated by the jet engine exhaust. The water vapor in the jet exhaust then condenses and forms a cloud. The rate at which contrails dissipate is entirely dependent upon weather conditions and altitude. If the atmosphere is near saturation, the contrail may exist for some time. Conversely, if the atmosphere is dry, the contrail will dissipate quickly.

Contrail Grid Patterns - Numerous contrails are usually over "air routes", or highways in the sky. Aircraft fly in all different directions at any time, and numerous contrails may seem to "crisscross". Although contrails may appear to cross, the trails can actually be from planes separated by significant altitude and time.

Chaff - Chaff are small bundles of aluminum coated fibers that create a large radar reflection. A radar seeking missile is unable to distinguish an aircraft from the chaff and loses the lock on the aircraft.

Chemtrails - Chemtrails is a term coined to suggest contrails are formed by something other than a natural process of engine exhaust hitting the cold air in the atmosphere.

Ethylene dibromide - Ethylene dibromide, or EDB, is a pesticide that was used commercially before being banned by the Environmental Protection Agency in 1983. During WW II, EDB was used as an additive in aviation gasoline to help stop lead in the aviation gasoline from plating out on valves. Jet fuels, including JP-8 have never contained EDB. Soil samples showing the presence of EDB are most likely residuals from previous use as a pesticide. Webster's dictionary definition of EDB: "a colorless toxic liquid compound $C_2H_4Br_2$ that is used chiefly as a fuel additive in leaded gasolines, that has been found to be strongly carcinogenic in laboratory

animals, and that was used formerly in the U.S. as an agricultural pesticide -- abbreviation EDB."

JP-8 Jet Fuel - JP-8 jet fuel consists of kerosene, a petroleum distillate fraction purchased to specification. The specification requires that the fuel producer meet a range of chemical and physical properties to ensure proper aircraft operation. Fuel additives are allowed, but are highly controlled. Additives include antioxidants, metal deactivators, corrosion inhibitors, fuel system icing inhibitor, and a static dissipater additive.

Rocket Exhaust - The exhaust plume generated by solid or liquid fueled rockets. Solid rocket motors are usually made of ammonium perchlorate and typically create light colored exhaust emissions. The exhaust is mainly carbon dioxide and water, but may also have high levels of hydrochloric acid formed, but which disperses rapidly. Liquid fuel rockets are generally kerosene and Liquid Oxygen (LOX) and produce an exhaust, which is darker and similar to aircraft exhaust. The exhaust is primarily carbon dioxide and water, but may contain nitrous oxides, sulfides, and soot particles.

Stratospheric Ozone - The ozone formed in the upper atmosphere through the interaction of the sun's energy and oxygen and which provides the natural shielding effect for the earth from UV rays. This ozone layer is susceptible to destruction by chlorinated compounds and is generally associated with the ozone hole over the Antarctic. Ozone in the lower atmosphere and ground level is generally a by-product of motor vehicle fuel combustion that forms NO_x as a precursor which then forms ozone. This ozone is often seen as smog in most major cities.

Vapor Trails - The trail formed behind an aircraft as result of air flowing over a surface which creates a cavity in the air, similar to a boat propeller in water.